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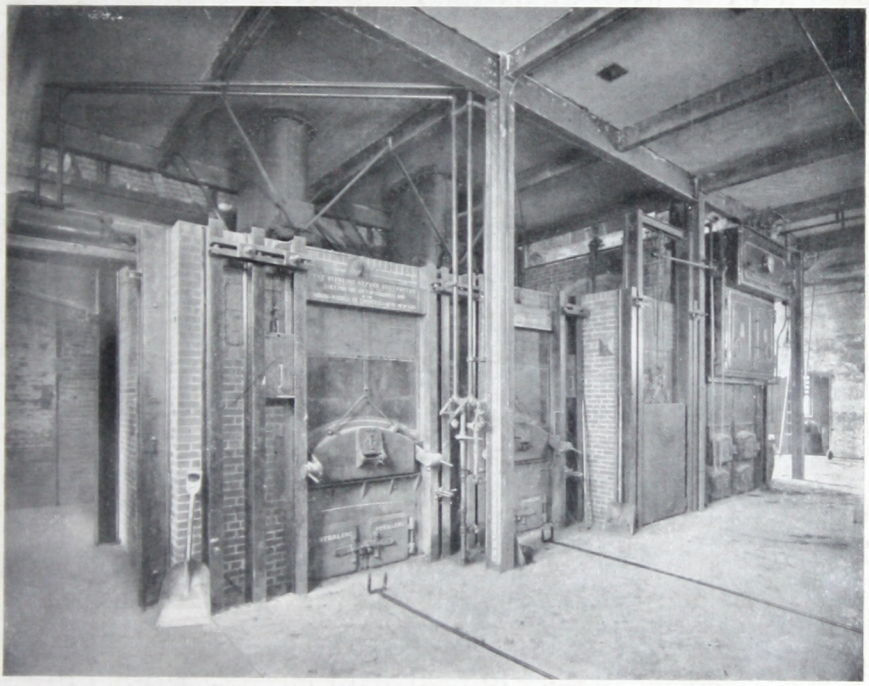
Sterling Refuse Destructor

COLUMBUS, OHIO

Bulletin No. 706



FRONT OF STERLING DESTRUCTOR AT COLUMBUS.

The Griscom-Russell Co.

90 West St., New York

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INTRODUCTORY

The English system of destroying combustible refuse by high temperature destructors has been adopted in every quarter of the world. The old unsanitary methods of refuse disposal have proven so objectionable that municipalities everywhere are welcoming these more modern and economical ways of handling wastes. Disposal of worthless matter by intense heat is now accepted as the only satisfactory solution of what has been heretofore a difficult problem.

Of the very few destructors which have met with marked success in practical use, the *Sterling* occupies the front rank. It is the design of Messrs. Hughes & Stirling of London, and has been developed under their careful supervision, with the assistance of their competent engineering staff.

For this continent, The Griscom-Russell Company enjoys full rights under the Sterling patents and designs, and with these rights are secured the co-operation and the advisory experience of Messrs. Hughes & Stirling. Designs, specifications and estimates for Sterling Destructors of any desired capacity, and calculated to deal with any description of municipal and trade waste, will be furnished upon request. All working plans and construction are in charge of experienced engineers and are subject to the approval of Hughes & Stirling. The world wide experience of the English house in connection with a great number of installations is the basis for the design and construction of Sterling Destructors.

Inquiries are solicited from all interested in the sanitary disposal of all forms of municipal waste and refuse from industrial plants.

DISPOSAL OF MUNICIPAL REFUSE BY HIGH TEMPERATURE DESTRUCTORS

The present time finds some of our largest cities and many smaller ones in the midst of bitter controversies as to the final disposal of their Municipal Refuse, including garbage, rubbish and household ashes. There are several makeshift methods of handling this refuse, such as dumping it on land or at sea; feeding the garbage to hogs, or reducing it to grease and tankage; incinerating by slow fire at low temperature—all objectionable, offensive and nuisance making. There is only one effective method of final disposal, that is, total incineration in High Temperature Furnaces, of which the Sterling Refuse Destructor is the leading example.

It must be remembered that the prime reason for municipalities to collect and dispose of refuse, is to prevent nuisance, spread of disease and fire risks, and any system which does not fulfil these three conditions for all classes of refuse fails in its requirements as a means of final disposal. A short description of the systems in use may clarify the subject to interested officials.

DUMPING ON LAND

Dumping garbage on an accumulating mass of rotting refuse produces bad odors, breeds swarms of flies, and is unsanitary. Dumping combustible rubbish produces nuisances from papers blowing about in the wind, smoldering dump fires, and the spread of disease germs from infected clothing and bedding which frequently reaches the rubbish pile. It is impossible to prevent children and others from picking over and scattering the rubbish, a most unsanitary practice. These evils are only slightly lessened by covering the dumps with ashes. Land filled in by rubbish heaps makes an unhealthy locality, affords the worst possible support for building foundations, and so remains worthless to the community for years.

DUMPING AT SEA OR IN RIVERS

Much of the light material dumped at sea or into rivers floats to land and fills the shore with rubbish. Bathing beaches are ruined by the presence of such filth. It is also no slight

objection to the method of dumping into deep water that many bargemen have been drowned as the result of slipping off the load or by the capsizing of overloaded barges.

HOG FEEDING

This is undoubtedly the most disgracefully unsanitary and objectionable method of disposing of large quantities of offal and garbage that has ever been employed. No community will tolerate the presence of large numbers of garbage-fed hogs. The few cities still permitting the use of this method of garbage disposal locate their hog farms far out of town, and the citizens try to forget where their pork comes from, or perhaps hope that it is bought by their neighbors in other cities instead of reaching their own tables.

REDUCTION

This method disposes of garbage by steam-cooking under high pressure to break up the fibre and release the grease. The resulting products are low grade grease and tankage. Many different methods have been tried, but so far all have produced bad odors, and fouled streams with offensive "stick-water" and waste. The nuisances from reduction plants have caused many tax payers' suits. As a means of disposal of municipal wastes, the reduction plant is incomplete—it handles only the garbage. It cannot dispose of rubbish, tins, ashes or manure, all of which must be collected separately from the garbage at large extra expense.

LOW TEMPERATURE INCINERATION

With this method the garbage and rubbish are burned in a large heap at comparatively low temperature, from 500° to 1,000°, using additional fuel, such as coal, to furnish the required heat. This method of slowly heating garbage drives off unpleasant smelling vapors and dense white smoke, which frequently creates a nuisance over a large area about the incinerating plant. Incinerators of this type cannot dispose of household ashes, which must, therefore, be collected separately at extra expense. It looks easy to the inexperienced brick masonry contractor to build a furnace for heating garbage, so that many have been tempted to submit bids to their home towns and to attempt what is really an extremely difficult matter—the construction of a low temperature incinera-

tor which will burn garbage inoffensively. As a result, a large proportion of garbage incinerators are nuisances, cost excessively to operate, have a high rate of depreciation, and require heavy and frequent repairs. These low temperature incinerators have tended to place the system in general disrepute, inasmuch as out of about 400 plants built, 50% have been either rejected by the municipalities, or abandoned as failures shortly after being put in service.

TOTAL DESTRUCTION AT HIGH TEMPERATURE

This method of burning the entire refuse collection of the city, consisting of garbage, rubbish, household ashes and other classes of refuse, in high temperature destructors, has proven the most satisfactory of any method for American cities, and is the approved method throughout the world. The combustion takes place at a high temperature under the effect of a high-pressure forced draft of preheated air. The temperature of the furnace is from 1,250° to 2,000°; the combustion is absolutely odorless and smokeless; no fuel is required other than the refuse itself. High pressure steam may be and usually is generated in waste heat boilers attached to these destructors.

HIGH TEMPERATURE DESTRUCTORS IN THE UNITED STATES AND CANADA

For total incineration, there are three designs of high temperature Destructors, of which the Sterling Refuse Destructor is the leading example. Many large American cities, after careful and thorough investigation by their engineers of plants in America and abroad, have adopted the high temperature system. There are at this writing 32 such Destructor plants in 27 different cities in the United States and Canada. Five cities have each more than one High Temperature Destructor. The total capacity of these 32 plants is 2,450 tons in 24 hours, or the equivalent of four heavy train loads of city refuse per day. Most of these Destructors generate high pressure steam from the waste heat. In ten of these plants, all of the steam is utilized either for pumping city water or sewage, generating electricity in municipal plants, or heating public buildings. The value of this high pressure steam as a by-product greatly reduces the net cost of operation.

The actual constant daily use of 32 large Destructor Plants is the best proof of the advantages of Total High Temperature Incineration.

If your city requires a garbage plant, profit by following the lead of those cities which have successfully solved the disposal problem. Have your specifications drawn properly and in detail for a High Temperature Destructor like the Sterling, which will burn without additional fuel all classes of municipal refuse, including the garbage, rubbish, household ashes, manure, market offal, carcasses of dead animals and night-soil.

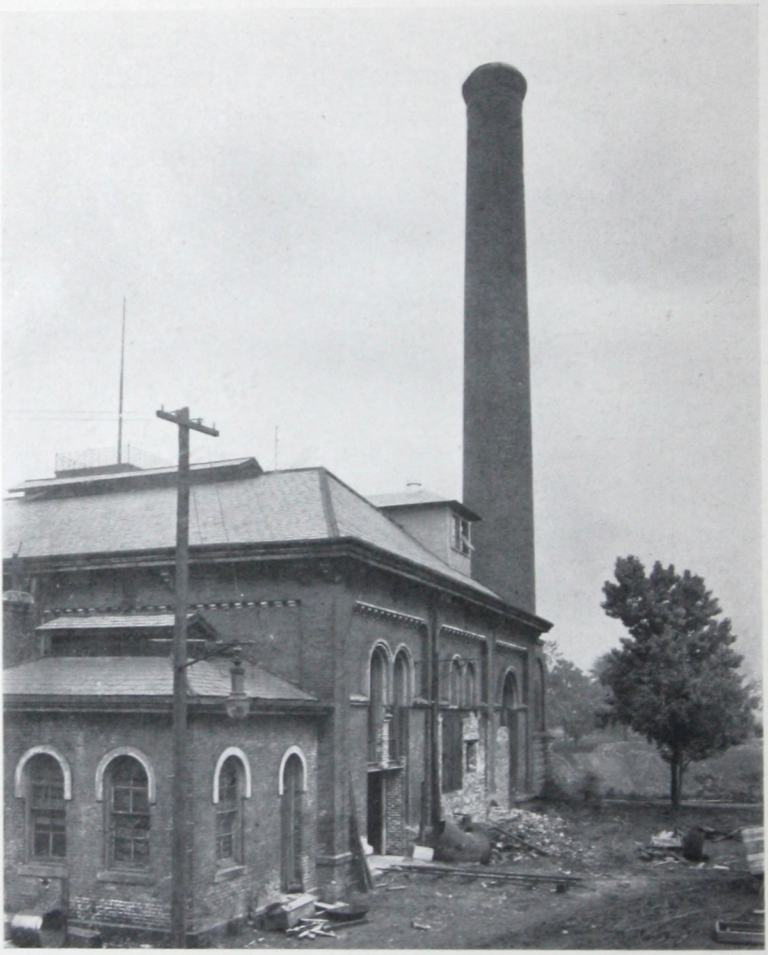
The Sterling Refuse Destructor is the leading furnace for the method of high temperature destruction of city wastes. The Destructor takes care of all kinds of refuse together—no separation is required either at the plant or in the household, and one collection system is all that is needed. The single collection system is convenient for the householders, costs much less than double or triple collections required for all other methods of disposal, and allows more frequent calls. The cost of collection is always several times the cost of the ultimate disposal of the wastes and is therefore a very important item. With the Destructor System, collection cost may be reduced to the minimum by locating the Destructor in the center of the collection district. This is possible even in the residence section of the city, because the Sterling Destructor operates without the slightest nuisance, smell, smoke or dust escaping from the plant.

PURPOSE OF STERLING DESTRUCTOR AT COLUMBUS

The City of Columbus, having had no means of disposing of the city rubbish other than by dumps, and desiring to put a stop to the nuisances produced by bad odors, dump fires, blowing paper, mosquitoes breeding in tin cans, infected bedding, vermin-filled mattresses and decaying garbage, decided in 1913 to build a High Temperature Incinerator of the Destructor Type, to dispose of this rubbish economically and without nuisance. The work was delayed by the destructive flood which occurred in the city in the spring of 1913. The contract was then awarded to the Griscom-Russell Company, and the plant was designed and built by them. The final tests were run in the spring of 1915.

DESCRIPTION OF PLANT

The City of Columbus has a municipal electric plant of large size and modern construction. Adjacent to this plant was a brick building formerly used as a water works pumping station. It was decided to utilize this building for the rubbish sorting and destructor plant, and plans were drawn accordingly. In this way there was made available a means of using all the steam which could be produced by the Destructor. The high pressure steam from the waste heat boiler is piped the short distance to the Municipal Electric Plant and used in driving the turbo generators.



Columbus, Ohio, Destructor Building.

EQUIPMENT OF STERLING DESTRUCTOR AT COLUMBUS

The Destructor Plant consists of Sterling Refuse Destructor of two cells with common combustion chamber, hydraulic charging containers, 200 H. P. Heine Water Tube Boiler with super-heater, and the necessary fan and motor for forced draft. The plant also includes a conveyor, and a picking belt from which are sorted salable parts of the rubbish; also well-designel bins for the storage of the different classes of rubbish, and presses for baling the rubbish for sale.

METHOD OF CHARGING RUBBISH INTO FURNACE

The rubbish is spread on the conveyor belt and carried upward past the sorters, then upward again to the charging floor above the Sterling Destructor. The worthless waste is fed into the cells through steel containers built into the charging floor. The containers are filled by hand as convenient. Each holds enough fuel for one charge of the furnace cell. The containers are operated by water pressure from the stoking floor through hydraulic cylinders and valves. When a fire needs more fuel, the fireman moves the handle of the valve admitting pressure to the proper hydraulic cylinder which slides the heavy brick-lined cover off of the charging hole in the top arch of the furnace and then tips the light steel doors at the bottom of the container above, allowing the charge of rubbish to slide down into the furnace. The movement of the hydraulic piston is then reversed, to close the container doors and then replace the heavy charging hole cover. By this arrangement there is no chance of rubbish above the fire room being ignited by sparks or an uprush of hot gas from the open charging hole. This apparatus enables the fire to be charged with comparatively small quantities of rubbish at regular intervals without inrush of cold air or emission of hot gases. These conditions of feeding are necessary for proper combustion in any type of high temperature furnace, whether under a boiler or in a destructor.

CAPACITY TEST

The rated capacity for this Sterling Destructor is 45 tons in 24 hours, equivalent to 3,750 lbs. per hour. The official capacity test was run for seven days, beginning May 21st, 1915. The furnace was operated by the regular attendants for eight hours per day. The test came during the house-cleaning season, and the amount of delivery at the plant varied greatly in tonnage from day to day. The total amount delivered during the test period was 154.05 tons, from which 17 tons of rags, paper, cans, etc., were sorted out. The remainder, 137 tons, was burned in 56 hours burning time, which is at the rate of 4,880 lbs. per hour.

LARGE EXCESS OVER GUARANTEE

As the actual rate of burning during the test for this two cell Sterling Destructor was 4,880 lbs. per hour and the guaranteed capacity was 3,750 lbs. per hour, the Sterling Destructor exceeded the guarantee by approximately 30%. The operation of the Destructor was in every particular entirely satisfactory.

SUMMARY

The attention of officials in cities contemplating refuse disposal plants is drawn to the advantages of Total High Temperature Incineration as practiced in the Sterling Refuse Destructor. These advantages are:

Low cost of labor.
Low cost of maintenance.
Perfect Combustion—no smoke.
Absolute freedom from nuisance or offensive odor.
Residue thoroughly burned and innocuous.
No fuel required other than the refuse itself.
Central location possible, decreasing collection cost.
Destruction of all classes of municipal refuse.

WE MANUFACTURE THE FOLLOWING SPECIALTIES:

Reilly Water Heater.
Goubert Water Heater.
Goubert Hot Water Generator.
Russell Storage Heater.
G-R Open Heater.
Reilly Oil Heater.
Reilly Lavatory and Bath Heater.
Reilly Evaporators.
Goubert Condenser.
Reilly Oil Coolers.
Reilly Distillers.
Russell Steam Engines.
Stratton Steam Separator.
Russell Steam Separator.
Bundy Oil Separator.
Reilly Feed Water Filter.
Reilly Aerating Filter.
G-R Electric Humidifier.
G-R Air Conditioning Devices.
Copper Expansion Joints.
Incinerators, Refuse Burners, The Sterling Destructors.

Bulletins describing any of these units will be sent upon request.

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